DOCUMENT RESUME

ED 135 987 CE 009 870

TITLE	An Assessment of Career Development: Basic Work Skills. Career and Occupational Development Report No. 05-COD-02.
INSTITUTION	Education Commission of the States, Denver, Colo. National Assessment of Educational Progress.
SPONS AGENCY	National Center for Education Statistics (DHEW), Washington, D.C.
PUB DATE	Jan 77
CONTRACT	OEC-0-74-0506
NOTE	41p.; Some tables may be marginally legible due to small print
EDRS PRICE	MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS	Academic Ability; *Basic Skills; Blacks; Caucasians; Communication Skills; Comparative Analysis; *Dropouts; *Educational Assessment; Educational Research; Geographic Distribution; *Job Skills; National Surveys; Parental Background; Post Secondary Education; Racial Differences; Secondary Education; Sex Differences; *Skill Development; Socioeconomic Background; *Task Performance; Writing Skills
IDENTIFIERS	United States

ABSTRACT

Since the U.S. Office of Education figures showed (at the time of this report) that on the average, 850,000 young people were dropping out of high school every year, 800,000 more were graduated from high school with no specific marketable skills, and 900,000 were dropping out of universities, junior colleges, and training schools, the study described in this report, conducted by the National Assessment of Educational Progress, was designed to determine what these different groups knew that would help them cope with the world of work. (Four age levels--9, 13, 17, and adults aged 26-35--were respondents in the study conducted during 1973-74.) This report presents, via summary data, work-related knowledge and skills, or proficiency levels, of the four age levels and delineates the proficiency of each group according to such variables as region of the country, race (black and white), education level of parents, and size and type of community. Three chapters are included. Chapter 1 briefly discusses major findings. Chapter 2 contains definitions of the population groups and item sets analyzed in the study, and a description of the conventions used to report the data. Chapter 3 examines and compares statistical data relating to the different groups' levels of performance. Chapter 3 discusses implications. (SH)

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NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS

AN ASSESSMENT OF CAREER DEVELOPMENT: BASIC WORK SKILLS

Selected Results From the First National Assessment of Career and Occupational Development

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Career and Occupational Development Report No. 05-COD-02

January 1977

CE 009 870

NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS
Suite 700, 1860 Lincoln Street
Denver, Colorado 80295

Roy H. Forbes, Director

Contract Agency:
NATIONAL CENTER FOR EDUCATION STATISTICS

Contract No. OEC-0-74-0506

NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS
A Project of the Education Commission of the States

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FOREWORD

The National Assessment of Educational Progress (NAEP) is an information-gathering project that surveys the educational attainments of 9-year-olds, 13-year-olds, 17-year-olds and adults (ages 26-35) in 10 learning areas: art, career and occupational development, citizenship, literature, mathematics, music, reading, science, social studies and writing. Different learning areas are periodically reassessed in order to measure change in educational achievement.

Each assessment is the product of several years' work by a great many educators, scholars and lay persons from all over the country. Initially, these people design objectives for each area, proposing specific goals that they feel Americans should be achieving in the course of their education. After careful reviews, these objectives are then given to exercise (item) writers, whose task it is to create measurement tools appropriate to the objectives.

When the exercises have passed extensive reviews by subject-matter specialists and measurement experts, they are administered to probability samples from various age levels. The people who compose these samples are chosen in such a way that the results of their assessment can be generalized to an entire national population. That is, on the basis of the performance of about 2,500 9-year-olds on a given exercise, we can generalize about the probable performance of all 9-year-olds in the nation.

National Assessment also publishes a general information yearbook that describes all major aspects of the Assessment's operation. The reader who desires more detailed information about how NAEP defines its groups, prepares and scores its exercises, designs its samples and analyzes and reports its results should consult the *General Information Yearbook, Report 03/04-GIY.*

ACKNOWLEDGMENTS

Many people have made substantial contributions to the career and occupational development (COD) assessment, from the beginning of the National Assessment of Educational Progress (NAEP) in 1964 to this report of findings in the area of career and occupational development. Unfortunately, it is not possible to acknowledge them all here, and an apology is due to those whose names have been omitted.

The preparation of the objectives and exercises in the area of COD was handled by the American Institutes for Research, Palo Alto, California. Materials were reviewed by dozens of consultants, including educators, employers and interested lay persons, under the general monitoring of the National Assessment staff.

Special mention must be made of several individuals and their contributions to the developmental phases: Marjorie Mastie, formerly of the National Assessment staff, who supervised the development of the COD exercises, and Dr. Ralph Bohn, San Jose (California) State College, who contributed to the development of objectives and exercises and also was extremely helpful in suggesting analysis schemes.

The administration of the career and occupational development assessment was conducted by the Research Triangle Institute, Raleigh, North Carolina, and the Measurement Research Center (MRC), Iowa City, Iowa. Scoring and processing were carried out by MRC and by the NAEP staff. Louise Diana and Susan Worthen of MRC provided invaluable assistance in developing and refining the categories used to score the exercises.

The actual preparation of this report was a collaborative effort of the National Assessment staff. Special thanks go to Bill Ankeny and Charlotte Ramlow for data processing support; Ava Powell for technical proofreading; and Marci Reser and Jessica Grant for production. This report was written by Gene Guerin.

Roy H. Forbes
Project Director

CHAPTER 1

MAJOR FINDINGS

U.S. Office of Education figures show that, on the average, 850,000 young people are dropping out of high school every year. Eight hundred thousand more are graduated from high school with no specific marketable skills. Nine hundred thousand are dropping out of universities, junior colleges and training schools. Each one of these groups places its own demands on the job market.

What do they know, regardless of the level of education reached, that will help them cope with the world of work?

In order to throw some light on this question, the National Assessment of Educational Progress (NAEP) examined the work-related knowledge and skills of four age levels within its national population sample. Young people of these age levels (9, 13, 17 and adults ages 26-35) were respondents in the National Assessment career and occupational development assessment during 1973-74.

The purpose of the assessment was to measure the proficiency of these various age levels in exercises calling for a grasp of basic competencies in computation/measurement, use of graphic/reference materials, written communication and manual/perceptual skills. Skills in these areas are considered basic not only because entire academic curricula are built on them but particularly because most jobs require some proficiency in them for success.

The exercises in which the groups tried their hand were geared toward general career problems, and results have given some indication of how the respondents would perform in "real world" situations. The items in the assessment were not developed to find out how well the population could read, write, compute, measure, use graphs and reference materials, or demonstrate manual and perceptual skills. Rather, the application of these skills to common, recurring situations of daily living was a paramount concern.

This report presents, via summary data, the proficiency levels of the four age levels. The report further delineates the proficiency of each group according to such variables, as region of the country, sex, race (black and white), education level of parents, and size and type of community.

The major findings of this report can be summarized as follows:

- There was a general increase of basic skills proficiency between age levels, from youngest to oldest.
- There was a pronounced superiority in performance among respondents whose parents had completed formal education at higher levels.
- Respondents living in impoverished urban areas showed significantly less proficiency in the exercises than those living in other sizes and types of communities.
- Males and females showed greater success in the skill areas traditionally ascribed to them (e.g., males did better in computation and measurement exercises; females did better in written communication exercises).
- In all areas, blacks showed significantly less success than whites.

- In the area of computation and measurement (1) adults showed most proficiency in successfully completing exercises, (2) males did significantly better than females and (3) blacks performed with less success than they did on other basic skills areas.

- In the graphic and reference skills area, males and females performed equally well with only slight variances above and below the national average.

- In the exercises dealing with written communication skills (1) females produced results consistently and significantly above the national average, while males had scores consistently and significantly below the national average, and (2) blacks had more success in this skill area than in the other three.

- In manual and perceptual skills (1) adults yielded to 17-year-olds in highest average percentage of success with exercises in manual and perceptual skills and (2) males performed with more success in this skill area than did females.

CHAPTER 2

REPORTING THE DATA: DEFINITIONS AND METHODOLOGY

This chapter contains definitions of the population groups and item sets analyzed in this study, and a description of the conventions that are used to report the data.

Population Groups Included in the Study

Sex

Results are presented for males and females.

Race

Currently, results are reported for blacks and whites.

Size and Type of Community

Community types are identified both by the size of the community and by the type of employment of the majority of people in the community.

High metro. Areas in or around cities with a population greater than 200,000 where a high proportion of the residents are in professional or managerial positions.

Low metro. Areas in or around cities with a population greater than 200,000 where a high proportion of the residents are on welfare or are not regularly employed.

Extreme rural. Areas with a population under 10,000 where most of the residents are farmers or farm workers.

Urban fringe. Communities within the metropolitan area of a city with a population greater than 200,000 outside the city limits and not in the high- or low-metro groups.

Main big city. Communities within the city limits of a city with a population over 200,000 and not included in the high- or low-metro groups.

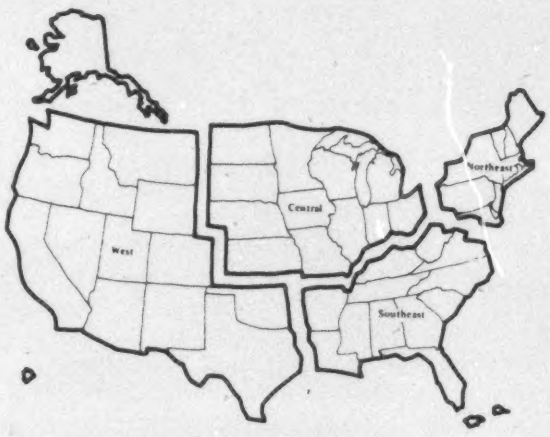
Medium city. Cities with populations between 25,000 and 200,000.

Small places. Communities with a population of less than 25,000 and not in the extreme-rural group.

Region

The country has been divided into four regions — Northeast, Southeast, Central and West. The states that are included in each region are shown in Figure 1.

FIGURE 1. National Assessment Geographic Regions



Parental Education

Four categories of parental education are defined by National Assessment. These categories include (1) those whose parents have had no high school education, (2) those who have at least one parent with some high school education, (3) those who have at least one parent who graduated from high school and (4) those who have at least one parent who has had some post-high school education.

Tasks Included in the Study

The items included in the summaries for this report all involved knowledge and skills related to the world of work. Other assessment items dealt with attitudes toward work, personal work experiences and knowledge about one's own abilities and interests. However, for the purpose of this report, which was to compare performance of various population groups, the items included were limited to job-related skills.

Four types of general job skills were assessed. They were as follows:

1. Computation and measurement skills.

2. Graphic- and reference-materials skills.

3. Written communication skills.

4. Manual and perceptual skills.

Computation and measurement skills included such items as calculating area in square feet and square yards, converting decimals to fractions and using a ruler. Use of graphic and reference materials demanded knowledge of certain conventions, for example, how to use graphs and charts, dictionaries, telephone books and so on. In the written communication section, respondents were asked to fill out an order blank, write a classified ad and write a job application letter. Manual and perceptual skills involved such things as following oral directions to complete a nonverbal task and drawing a three-dimensional object in perspective.

Reporting the Data

Examining the data from each career and occupational development (COD) item included in the two major COD knowledge categories would result in an unmanageable proliferation of numbers. Thus, this report employs summary values to describe the general performance of various groups of the population on different sets of items. Summary values are useful in that they show typical achievement levels; however, it must be remembered that they do tend to mask extreme cases.

In this report, the mean (simple average) of a set of results is used as the measure of central location. Percentages for each item in a particular content group were averaged to obtain a national mean. The differences in performance between a reporting group and the nation on each item were averaged for each group, providing mean differences from the national performance.

National Assessment uses a national probability sample to estimate the percentage of individuals in a given group who could successfully complete a given item. Thus, for example, when we say that "85% of the 13-year-olds gave a correct response," we mean that 85% is an estimate of the proportion of all 13-year-olds in the country who could have answered correctly. As in any survey work, the percentage estimates are subject to sampling error because observations are made only on a sample, not on the entire population.

The particular sample used in this survey is one of a large number of all possible samples of the same size that could have been selected using the same sample design. Percentages obtained from each of the possible samples would differ from each other, and the standard error of these percentages, if it were known, would provide a measure of the sampling variability among all possible samples. In this report, standard errors are estimated both for specific exercises and for the mean percentage on a group of exercises for each population group.

The standard error of a sample statistic can be used to construct a confidence interval for the estimate. The interval from two standard errors below to two standard errors above the particular sample value would include the average of all possible sample values in about 95% of the samples. An interval computed in this manner is called a 95%-confidence interval to indicate how confident we are that the interval contains the average over all possible samples.

When we note that a percentage is a "significant difference," we mean that it is more than two times larger than the standard error; we are therefore 95% confident that the difference is real and not an artifact of sampling variability.

Released Exercises

National Assessment released approximately half of the exercises administered in the COD assessment. The unreleased exercises will be reassessed in a future assessment to provide measures of change in ability levels. In this report, results for both released and unreleased exercises are summarized; however, exercise text appears only for released exercises. Copies of all released COD exercises are available from National Assessment upon request.[1]

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[1] *Career and Occupational Development Technical Report: Exercise Volume, Report 05-COD-20* 1973-74 Assessment (Washington, D.C.: Government Printing Office, forthcoming).

CHAPTER 3

A LOOK AT THE DATA

In a booklet published for the Chamber of Commerce of the United States, entitled *CAREER EDUCATION*,[1] several problem areas are identified as significantly affecting students leaving the education system and entering the job market. The booklet, prepared in cooperation with over 20 nationally recognized education organizations, associations and agencies, calls for reform in these problem areas.

Among the problems cited are the following:

- Many young people begin their pursuit of careers only after they have left high school rather than "during the early learning years when there is ample time to develop areas of work interest and competence."

- Many students do not have the necessary skills and knowledge to adjust to the world of work. The booklet terms this situation a lack of "cope-ability" in adjusting to changing job opportunities.

- Many students are not prepared to apply their school experiences to the marketplace. Classrooms "seem to attempt to prepare our young people to take their place in the community by isolating them from the community."

These problems can be translated into very real concerns both for employers and for the millions of young people who leave school yearly and set out in search of a satisfactory career. Employers are plagued with doubts about the latest group of job seekers coming to them from the schools. How much training will prospective employees need? How basic will the training have to be? How well-motivated to work are these new job seekers? How much do they know about the world of work? How much do they know about themselves?

The young people also have their doubts. What kinds of careers are waiting for them? How well-equipped are they to handle these careers? How easily will they find jobs that are both satisfying and fulfilling?

These are the types of questions that career and occupational development programs set out to answer. However, both prospective employer and employee also need answers to a deeper, underlying question: How well-versed are these young job seekers in the basic skills needed to obtain most jobs?

It is to this most basic of career and occupational development questions that the National Assessment of Educational Progress (NAEP) addressed itself in its nationwide survey of 9-, 13- and 17-year-olds and young adults (ages 26-35).

The testing was done to produce data centered around four skill areas that are useful for most jobs. A deficiency in one or more of these skill areas can limit a person's job options, job opportunities and job mobility and advancement.

The four areas chosen for the testing of basic skills include: (1) computation and measurement, (2) use of graphic and reference materials, (3) written communication and (4)

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[1] *CAREER EDUCATION* (Washington, D.C.: Chamber of Commerce of the United States of America, 1975).

manual and perceptual tasks. This chapter will set forth the findings of the survey.

The data will be presented in four sections, each dealing with one of the basic skill areas. Within each section there will be a discussion of the results for a number of different population groups (i.e., age, sex, race, region of the country, level of parental education and size and type of community). The four age levels will be considered individually and as they compare to each other. Summary data will also be included with appropriate conclusions where possible. The reader is asked to look at the data within two contexts: first, as an indication of proficiency in basic academic subjects and, second, as an indication of entry-level proficiency into the job market.

Computation and Measurement Skills

The computation and measurement items assessed skills in working with numbers and numerical concepts. There were problems requiring addition, subtraction, multiplication and division for their solution, and also tasks that involved the use of common measurement conventions (e.g., length, height, width, temperature, time, etc.).

Following is an example of an exercise administered at all four age levels.

Use the ruler you have been given to find the length of the line ABOVE. Write your answer on the answer line BELOW.

ANSWER 3 3/8 *inches*

The exercise was a simple one, requiring only one operation, that of using a ruler correctly. The exact answer to the exercise is 3 and 3/8 inches or its equivalent (e.g., 3 and 6/16 inches). Since the rulers were not of high quality, answers from 3 and 1/4 to 3 and 1/2 inches were acceptable.

Approximately 82% of the adults and 81% of the 17-year-olds gave an acceptable answer. Ten percentage points lower, at 71%, was the group of 13-year-olds; the 9-year-olds, only 46% of whom gave acceptable answers, were far behind.

Most 9-year-olds, however, are not at a level of numerical manipulation that would require such a precise, fractional determination as is called for in the exercise. (This is borne out by the fact that only seven-tenths of a percentage point of the 9-year-old population gave the exact correct answer while a little over 45% gave an acceptable approximation. A full 7% of the respondents in this age level either gave no answer at all or indicated that they did not know the answer.) The number of "no responses" and "don't knows" drops considerably to 2% among 13-year-olds, indicating that most of the respondents in this age level have become familiar with more precise measurements by this point in their schooling. The small difference between the two older age levels (17-year-olds and adults) seems to indicate that not a great deal of improvement in this skill takes place after high school.

In the following exercise, not given to the 9-year-old population, the respondents were asked to solve a problem that is common in the world of commerce.

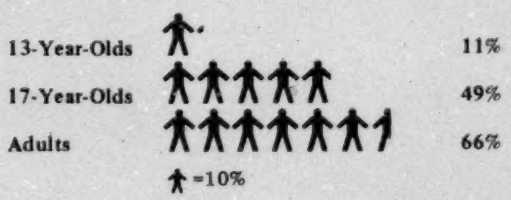
Suppose you purchased $200.00 worth of merchandise from a store on an installment plan. You are to make 24 monthly payments of $11.35 each. How much money in finance charges will you have paid at the end of two years?

ANSWER $72.40

This exercise demanded several things of the respondents. First, there was need for a basic knowledge of installment buying and interest payments; secondly, those working on the problem would have to use two mathematical operations in the correct sequence in order to reach an acceptable solution. Acceptable answers were $72.40; 72.40; or 272.40 - 200.

Figure 2 shows the percentage of acceptable answers given by each age level.

FIGURE 2. Percentages of Respondents Calculating Finance Charge, Ages 13, 17 and Adult



The exercise is an interesting one because it poses a realistic and common consumer problem. It is, of course, not as complex as many real situations regarding interest payments, and it is certainly more clearly stated than is usual for such negotiations.

Although the percentage was low for 13-year-olds, few of them could be expected to perform well on such an exercise. Considerably more unsettling is the fact that only about half of the 17-year-old group was able to complete the exercise correctly. This group makes up a significant part of the consumer public and should be familiar with common economic practices.

The adults scored the highest in this exercise, quite probably due to the fact that they have had the most exposure to this type of transaction. What is most noteworthy about the results for this group is not that it did so much better than the other two groups, but that almost 34% of the adult respondents did not cope with a simple problem that can touch them so personally.

One more sample exercise may shed further light on the "cope-ability" of our populations in the practical world. Respondents were presented with an exercise requiring the conversion of several units of measurement into other units (e.g., inches to feet, ounces to pounds). The exercise first required the recall of certain unit values and, second, the mathematical process of conversion (multiplication or division).

The exercise as it appeared to the respondents follows.

A.	*30 inches*	=	2½	*feet*
B.	*2 feet*	=	24	*inches*
C.	*45 seconds*	=	¾	*minutes*
D.	*1 minute*	=	60	*seconds*
E.	*16 ounces*	=	1	*pounds*
F.	*1½ pounds*	=	24	*ounces*

The exercise serves two functions. It can give some indication of people's facility in dealing with daily mathematical demands, either in the home or in the marketplace. It can also reveal proficiency in some basic skills that are required for certain jobs (e.g., clerk, carpenter, warehouse worker).

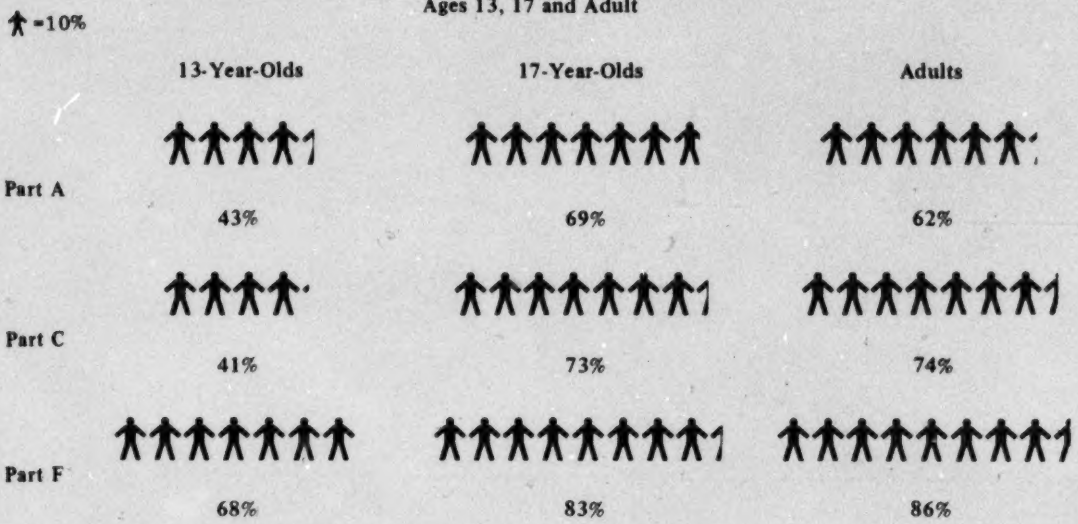
Over 90% of the people in all three groups (13-year-olds, 95%; 17-year-olds, 98%; adults, 96%) correctly answered part D of the item. However, having established the fact that a large number of respondents were familiar

with the value of the units involved in the problem (i.e., seconds and minutes), it is significant to note that many of the respondents were not able to work with fractions. Part C asks for a mathematical application of this information, and the success rates fall off sharply (13-year-olds, 41%; 17-year-olds, 72%; adults, 74%).

The same situation holds true for parts A and B and parts E and F. In each case all three ages scored considerably higher in familiarity with the value of the units in question than they did in using this information in a mathematical operation.

The relative successes at each age in the slightly more difficult mathematical conversion operations of the exercise (parts A, C and F) are shown in Figure 3.

FIGURE 3. Percentages of Respondents Converting Successfully, Ages 13, 17 and Adult



Once again, the question does not seem to be how many of the respondents completed the exercise correctly but rather how many did *not*. The types of careers that would require the amount of mathematical proficiency called for in this exercise are not particularly demanding in an academic sense. Most jobs as clerks, check-out cashiers and craft apprentices are entered by persons with a high school diploma or less. What is asked for in these careers is not an academic degree, but a facility with basic skills. Based on this, a significant number of our population could not qualify for these jobs.

These sample exercises give some general idea of the extent to which several age levels have mastered some basic computation and measurement skills. They also represent a context in which employers and job seekers can ask some of the questions we posed at the beginning of this chapter: How much training will job seekers need? How basic will the training have to be? How well-equipped are they to handle various careers?

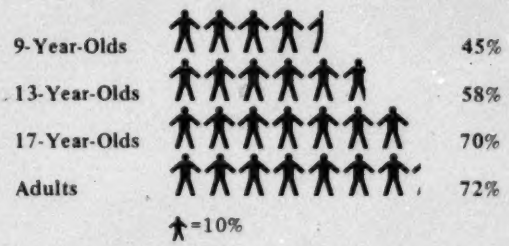
We do not propose that the assessment of a few bits of data will give answers to these questions. What the data do point out,

though, is that basic math and measurement skills needed for ordinary situations seem to be missing from the personal resources of a significant number of people.

Summary: Computation and Measurement Skills

What follows is a summary of results based upon performance on all the computation and measurement items assessed (19 at age 9, 30 at age 13 and 28 at ages 17 and adult) (Figure 4).

FIGURE 4. Summary Results for Computation and Measurement Exercises, All Ages



National Percentages of Success

Strictly speaking, we cannot compare the national percentages of success of the age levels because, except for the 17-year-olds and adults, each age took somewhat different sets of exercises.

Percentages of Success According to Region

Table 1 shows the relative success of each age level by region compared to the national average for that group.

Several generalizations hold across all age levels: (1) the Western region of the country, with no significant difference from the national average in *any* age level, seems to be a bellwether for gauging certain educational trends; (2) the Southeastern section of the country performs significantly lower than the national average for each age level; (3) the Central and Northeastern regions tend to be (with two exceptions) consistently and significantly above the national average for each age level.

There are some other observations that can be made from the data: (1) the Central region shows the largest increase between any two age levels (i.e., from 45 to 60% between ages 9 and 13) and (2) adults in the Western region show the largest margin of success among adults when compared with the 17-year-old groups.

Percentages of Success According to Sex

Table 2 shows the relative success of each age level by sex compared to the national average for that age level.

The data on the relative success of males and females in computation and measurement

TABLE 1. Regional Results for Computation and Measurement Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	45%	58%	70%	72%
Southeast	*40	*51	*64	*67
West	44	57	70	74
Central	45	*60	*73	*76
Northeast	*49	*61	*72	73

**Denotes a significant difference from the national average.*

TABLE 2. Male-Female Results for Computation and Measurement Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	45%	58%	70%	72%
Male	*47	*60	*72	*76
Female	*43	*56	*68	*69

**Denotes a significant difference from the national average.*

exercises is consistent and significant throughout. Females performed below the national average across the board. Adult males demonstrate a consistent upward trend over males in other age levels. It is also among adults that males and females show the largest divergence from the national average (males to the better, females to the worse).

Percentages of Success According to Race

Table 3 shows the relative sucess of each age level by race (black/white) compared to the national average for that age level.

As with the data on males and females, the data on the relative success of blacks and whites in computation and measurement are consistent and significant throughout. Black percentages were distinctly lower. Although blacks also showed a progressive and consistent trend upward, with black adults demonstrating the best overall proficiency, their difference from the nation remained about the same at ages 13, 17 and adult; there is the least amount of divergence from the national average among 9-year-old blacks.

TABLE 3. Racial Results for Computation and Measurement Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	45%	58%	70%	72%
Black	*32	*37	*49	*52
White	*48	*61	*73	*75

**Denotes a significant difference from the national average.*

Percentages of Success According to the Level of Parental Education

Table 4 shows the relative success of each age level by the level of education reached by parents of the respondents.

The data indicate that, for the most part, the various age levels may be influenced in their computation and measurement proficiency by the level of education reached by their parents.

At all ages, respondents whose parents did not complete high school were, as a group, significantly below the national average. It

TABLE 4. Parental-Education Results for Computation and Measurement Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	45%	58%	70%	72%
No high school	*38	*46	*60	*65
Some high school	*42	*51	*62	*67
Graduated high school	*46	58	69	*76
Post-high school	*51	*65	*75	*81

**Denotes a significant difference from the national average.*

also appears that the more schooling the parents had, the closer the group came to meeting the national average.

Percentages of Success According to Size and Type of Community

Table 5 shows the relative success of each age level, by size and type of community, compared to the national average.

TABLE 5. Size-and-Type-of-Community Results for Computation and Measurement Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	45%	58%	70%	72%
Low metro	*32	*45	*59	*57
Extreme rural	42	57	72	73
Small places	*47	58	71	74
Medium city	44	55	70	69
Main big city	44	57	70	69
Urban fringe	46	60	71	74
High metro	*54	*66	*75	*81

**Denotes a significant difference from the national average.*

but only as a means of better applying the information garnered through the use of the instruments in question.

The use of graphic- and reference-materials skills in the career world is almost universal. A delivery person must know how to read a map and plan a route; a clerk must be able to use sales tax tables; almost any job seeker or consumer must be able to find information in a newspaper or telephone directory. The test items were intended to determine the

Graphic- and Reference-Materials Skills

Graphic- and reference-materials skills deal with the ability to obtain and interpret information by using various conventional instruments such as reference books, graphs, tables and maps. Respondents who were given test items in this learning area were asked to apply such instruments to several types of problems. In many cases, mathematical and/or reading skills were brought into play

proficiency of respondents in these practical operations. Nine-year-olds were asked to read time off a clock dial; 13-year-olds were asked to select, according to topic, one book from a list of books; 17-year-olds and adults were asked to use a table from a federal income tax form. In every case the problem posed was practical and applicable to everyday life.

The following is a sample of the type of exercise that respondents at all four age levels were asked to complete.

(Give respondent the following: telephone book and card. Use stopwatch.)

"Look up the telephone number of the Snack Shack. Here is how Snack Shack is spelled. (Point to card.) For this exercise, I will be timing you. Tell me when you have found the telephone number and show it to me. Start now. (Begin timing. If respondent does not finish within 5 minutes, end the exercise.)

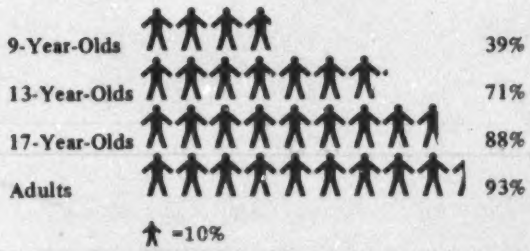
- ⬭ *Correct (Number should be: 634-4552)*
- ⬭ *Incorrect*
- ⬭ *Did not find any number*
- ⬭ *I don't know*
- ⬭ *No response*

Time required: _____ minutes, ___ seconds

The exercise required that the respondent find the name "Snack Shack" in a telephone book and accurately determine which number from a column of numbers corresponded to the name. Success in this operation presumed that the respondent was acquainted with alphabetical indexes and their use and had a certain level of aptitude in working with small details.

Figure 5 shows the relative success of respondents in each age level in accomplishing the task correctly in three minutes or less.

FIGURE 5. Percentages of Respondents Giving Correct Answer to Telephone Number Exercise, All Ages



To the 9- and 13-year-old groups, the task seemed to be an unfamiliar one. Nine percent of the 9-year-olds and 7% of the 13-year-olds either entered an "I don't know" response or gave no response at all for this item. It cannot be determined whether these groups were unfamiliar with alphabetical indexing procedures, could not apply these procedures to a small town telephone book or were unfamiliar with the uses of any telephone book.

It is somewhat surprising that almost 4% of the 17-year-old group seemed beset by this same lack of familiarity (4% entered "I don't know"). Equally surprising is the fact that only 88% of this age level were able to complete the exercise correctly. These data might be explained in part by the fact that, on this exercise, most of the scores below the national average for this age level came from low-metro areas and from the group whose parents had not gone to high school.

Rather than devoting much time to the observation that over 12% of the 17-year-olds and approximately 7% of the adults cannot use a telephone directory, it would probably be more useful to note that significant numbers of adults or near-adults cannot take advantage of certain resources to obtain jobs and services. Since the telephone is frequently the first and most convenient mode of communication, particularly in business situations, it would be interesting to speculate about how many people are unemployed or have not sought help and/or training for

employment because they do not know how to use the information that a telephone directory could give to them.

In another exercise that was geared to the 13-, 17-year-old and adult populations, another kind of reference operation was required.

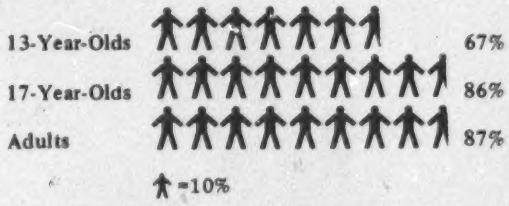
SIZE TABLE FOR SOCKS

Shoe Size	Sock Size	Shoe Size	Sock Size
6-6½	9½	9-9½	11
7-7½	10	10-10½	11½
8-8½	10½	11-11½	12

According to the table, what size socks should you buy if you wear size 10 shoes?

- ○ *7*
- ○ *7½*
- ○ *10*
- ○ *10½*
- ○ *11*
- ● *11½*
- ○ *I don't know.*

FIGURE 6. Reading a Table, Ages 13, 17 and Adult



The task is a common one with obvious applications to many occupations. It requires a certain attention to detail, as well as familiarity with the setup of certain conventional tables. Figure 6 shows the relative success of the age levels in accomplishing the task.

It can be expected that adults would score highest on this item since, by and large, adults more often buy clothes for themselves and their families.

The fact that no group performed above 90% gives room for some speculation on the data.

Tables of the type shown in the sock example are commonplace in many careers. Salespeople in clothing stores must obviously know how to use such instruments. Service station attendants must be able to read tables in parts catalogues, containers and other instruments if they are to supply proper pressures, fluid levels and parts to an automobile.

There are also a number of occasions when a consumer must refer to graphs and tables. It may be a table of fines listed on the back of a parking ticket, the amount of money for tax

and shipping charges to be included in a mail order, the amount and proportion of ingredients to be used in a baby formula according to the infant's age and size or, for that matter, the size of socks one needs.

It cannot be determined whether respondents who failed to complete the exercise were unfamiliar with the use of tables, could not transfer their knowledge of certain tables to the particular one used in the example or were unable to understand the directions on the item. Whether the predominant reason for failure was one of the above or a combination of all three, one thing is clear: many people would be hard-pressed to show proficiency in the graphic and reference requirements of most jobs. Many people are at a disadvantage in the marketplace as consumers because they are lacking in certain skills that can protect them from misuse of consumer goods or from being sold something they cannot use.

Summary: Graphic- and Reference-Materials Skills

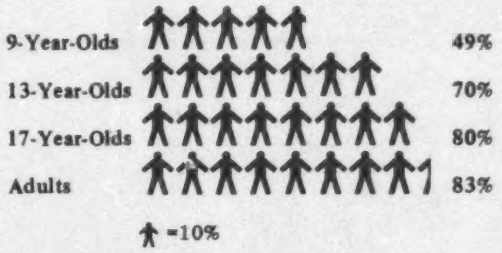
The following pages contain a summary of results of the data covering the four population groups (9-, 13-, 17-year-olds and adults) in the learning area of graphic- and reference-materials skills.

National Percentages of Success

National percentages of success according to age level in the learning area of graphic- and reference-materials skills did not reveal any startling facts. The 9-year-olds showed the lowest percentage of success with items in this learning area, while the adults, with the advantage of practical experience both as consumers and workers, had the highest percentage score. Results would probably have been the same had they all taken identical sets of exercises (Figure 7).

Because skills that were to be showcased by the exercises in this section are so much a part of living, it is cause for discussion that 20% of the 17-year-olds have questionable proficiency in this area. The fact that 17% of the adults also show little proficiency in tasks that, no doubt, face them daily, compounds the concern.

FIGURE 7. National Results for Graphic- and Reference-Materials Skills, All Ages



Percentages of Success According to Region

Table 6 shows the relative success of each age level by region of the country compared to the national average of that age level.

The Southeastern part of the country is the only region that shows a slight, though statistically significant, difference from the national average for each age level.

Percentages of Success According to Sex

Table 7 shows the relative success of each age level by sex compared to the national average of that age level.

There are no clear-cut trends in the area of graphic- and reference-materials skills for males and females as there were in the learning area of computation and measurement.

Percentages of Success According to Race

Table 8 shows the relative success of each age

level by race (black/white) compared to the national average for that age level.

As in the learning area of computation and measurement, there is still a consistently significant difference on the part of blacks and whites in each age level, compared with the national average for each group.

Once again, a progressive trend can be seen for both blacks and whites between the various age levels, the adults scoring highest in both groups.

TABLE 6. Regional Results for Graphic- and Reference-Materials Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	49%	70%	80%	83%
Southeast	*43	*64	*75	*77
West	48	69	79	84
Central	51	*73	*83	*86
Northeast	*52	71	*81	83

**Denotes a significant difference from the national average.*

TABLE 7. Male-Female Results for Graphic- and Reference-Materials Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	49%	70%	80%	83%
Male	*50	69	80	84
Female	*48	*70	80	82

**Denotes a significant difference from the national average.*

TABLE 8. Racial Results for Graphic- and Reference-Materials Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	49%	70%	80%	83%
Black	*33	*47	*59	*63
White	*52	*74	*83	*86

**Denotes a significant difference from the national average.*

Percentages of Success According to the Level of Parental Education

Table 9 shows the relative success of each age level according to the level of education reached by their respective parents.

Homes in which the parents have some post-secondary education seem to offer the setting most conducive to the use of graphic and reference materials. Across the board, respondents with parents in that category perform above their peers in other categories and significantly above the national average.

At the other extremes, homes in which the parents have no high school education do not seem to offer the same opportunities to participants in our survey. These respondents perform below their peers in other categories and consistently score significantly below the national average for their respective age levels. This is also true for respondents whose parents had some high school education.

Respondents in the graduated-from-high-school group showed no significant variance from the national average except in the case of the last two age levels.

It would be expected that parents with high school or post-secondary education would have the greatest opportunity (more jobs, higher buying power) to exercise graphic- and reference-materials skills.

TABLE 9. Parental-Education Results for Graphic- and Reference-Materials Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	49%	70%	80%	83%
No high school	*38	*56	*68	*76
Some high school	*42	*62	*73	*78
Graduated high school	48	70	79	*87
Post-high school	*55	*77	*85	*90

**Denotes a significant difference from the national average.*

Percentages of Success According to Size and Type of Community

Table 10 shows the relative success of each age level by size and type of community, compared to the national average.

The variables incorporated into the size-and-type-of-community category are particularly economic in nature. Where you live, or rather where you *can* live, is pretty well dictated by the economic bracket in which you find yourself.

Seen in this perspective, it comes as no great shock that people living in low-metro communities do poorly, compared to the national average, while people living in high-metro areas do significantly better.

Written Communication Skills

The particular communication skills tested in the NAEP career and occupational development survey focused on writing. If communication can be simplistically defined as the ability to let someone know what you think, written communication skills should reflect a person's ability to get a message across in writing.

There was no emphasis given to creative ability in the test items in this section. The skills that were stressed were the ability to think clearly and to express these thoughts on paper with some sense of logic and order. Writing mechanics such as spelling, grammar and punctuation were not scored unless they rendered a letter incomprehensible.

TABLE 10. Size-and-Type-of-Community Results for Graphic- and Reference-Materials Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	49%	70%	80%	83%
Low metro	*32	*56	*69	*68
Extreme rural	46	67	80	82
Small places	50	70	81	84
Medium city	49	69	80	79
Main big city	46	68	82	80
Urban fringe	49	72	81	*86
High metro	*58	*79	*85	*91

**Denotes a significant difference from the national average.*

The exercises in the written communication section were all practical in nature and covered normal job-seeking situations.

One sample of the type of exercise that was given to both 9- and 13-year-olds follows.

> *Pretend that your name is Dale Roberts and you live at 1545 Lake Street in Narka, Kansas. The zip code for Narka, Kansas, is 66960. You have written a letter to John Way. He lives at 345 Moose Street, Nome, Alaska. The zip code for Nome, Alaska, is 99762. Address the envelope below. Make sure you write down everything that should go on the envelope.*

The exercise required several operations: (1) that the students understand the instructions, (2) that they be familiar with addressing envelopes, (3) that they recognize the function of the several parts of the address (both return and forwarding) and (4) that they address the various parts of the envelope correctly.

Six elements of the addressed envelope were scored: return name, return address, return city/state/zip, addressee name, address and city/state/zip.

Table 11 shows the national averages of 9- and 13-year-olds for each of the six parts of the exercise.

TABLE 11. Addressing Envelope Results, Written Communication Skills, Ages 9 and 13

	9-Year-Olds	13-Year-Olds
Return name	64%	94%
Return address	61	92
Return city/ state/zip	62	92
Addressee name	68	95
Addressee address	63	93
Addressee city/ state/zip	62	93

As would be expected, on each item the percentages for 13-year-olds are considerably higher than the comparable scores of 9-year-olds. A comparison of percentages for each item indicates that names were easiest, addresses slightly more difficult and city/state/zip slightly more difficult yet at each age.

One possible reason for this pattern is that the "name" items are the simplest to understand and the easiest to carry out. On the other hand, the section devoted to city, state and zip code calls for most attention to detail and has the most complex assortment of ingredients.

A closer look at the 13-year-old level's data does not offer any particular surprises in any of the categories covering region, race, level of parental education or size and type of

community. The achievement patterns are the same as those mentioned extensively on previous pages. Only in the category of sex do we find that females do better than males and significantly better than the national average in all parts of the exercise.

Following is a sample of the type of exercise given to 17-year-olds and adults.

Below are three ads from the Help Wanted section of a newspaper. Read all three ads and choose which job you would like best if you had to apply for one of them.

-Help Wanted-

OFFICE HELPER: experience in light typing and filing desirable but not necessary, must have 1 yr. high school math and be able to get along with people. $2.50/hr. to start. Start now. Good working conditions. Write to ACE Company, P. O. Box 100, Columbia, Texas 94082.

-Help Wanted-

SALESPERSON: some experience desirable but not necessary, must be willing to learn and be able to get along with people. $2.50/hr. to start. Job begins now. Write to ACE Shoestore, P. O. Box 100, Columbia, Texas 94082.

-Help Wanted-

APPRENTICE MECHANIC: some experience working on cars desirable but not necessary, must be willing to learn and be able to get along with people. $2.50/hr. to start. Job begins now. Write ACE Garage, P. O. Box 100, Columbia, Texas 94082.

Fill in the oval beside the ONE you choose.

On the next two pages, write a letter applying for the job that you chose. Write the letter as if you were actually trying to get the job. Use the name Dale Roberts.

Several aspects of this item were scored. Table 12 shows percentages of success for each age level on a number of the elements scored.

The table reflects the percentages of respondents who performed two overall operations (first, they thought of the elements to be included in a business letter and, second, they rendered those elements correctly).

Comparing the relative results of the 17-year-olds and adults, it would appear that the older group is more adept in the overall expression of their thoughts in writing: more

TABLE 12. Job Application Letter Results, Written Communication Skills, Ages 17 and Adult

	17-Year-Olds	Adults
Correct job description	78%	82%
Correct description of qualifications	93	90
Correct provision of references	9	14
Correct approach for interview	16	26
Correct information to make contact by employer possible	36	42
Correct format for return address	20	24
Correct form for date on letter	32	40
Correct format for inside address	33	39
Correct format for greeting	92	88
Correct format for closing	85	82
Signature included in accepted mode	85	85

of them described the job, provided references, requested an interview and gave information about where and how they could be contacted. In these particular "expression" areas, 17-year-old percentages were higher only in the section on job qualifications.

In the formal areas of the letter there seems to be somewhat of a stand-off between the two age levels: the teenagers did better with the greeting, closing and signature while the adults did better with things such as return address, date and inside address.

A breakdown of the data according to region, sex, race, level of parental education and size and type of community does nothing more than underline the trends that we have seen up to now in these categories: the Southeast region of the country scored consistently below the national average on this type of exercise, females and whites showed more proficiency, respondents from more educationally oriented home environments did better and people from the more affluent neighborhoods showed their usual advantage.

A comment on the jobs chosen for use in the exercise by members of the two age levels brings up some interesting points. Table 13 indicates the percentage of each age level that chose a specific job.

TABLE 13. Respondents Choosing a Specific Job, Written Communication Skills, Ages 17 and Adult

	17-Year-Olds	Adults
Office helper	44%	40%
Salesperson	25	31
Apprentice mechanic	30	29

The two succeeding tables add the dimensions of region, race, etc. to the picture (see Tables 14 and 15).

We must be careful not to put too much emphasis on these job selections. After all, respondents were only given a choice between three jobs. Although the three choices do not represent all jobs, they do, however, fall into three different job categories with which most people are familiar: the office helper fits into the white-collar world; the salesperson fits into the world of direct commerce; and the apprentice mechanic is, of course, in a blue-collar profession. If the data do not tell us what our population would like to do for a living, they can possibly give us some indications of general career tendencies among our respondents.

Females in both age levels seem to gravitate toward the more traditional "female type" careers embodied in the office helper. Males also follow true to form by selecting the blue-collar, physical career over the other two. Blacks leaned heavily toward the office as teenagers (but black adults, perhaps seeing greater opportunity elsewhere, chose the world of commerce). All respondents chose the white-collar career field over the other fields regardless of the level of the parental education. Teenagers also selected the white-collar job regardless of the size or type of community in which they lived. Adults who lived in low-metro areas, on the other hand, tended to select commercial and blue-collar jobs. Adults in the other size-and-type-of-community categories showed similar white-collar aspirations.

Summary: Written Communication Skills

The following five segments deal with summary results drawn from the percentages of success of the four age levels in the area of written communication skills.

SPECIAL NOTE: The reader is cautioned against making any across-the-board comparisons between the age levels, particularly in the written communication content area. There was very little overlapping of items between the two youngest age levels (9- and 13-year-olds) and the two older levels (17-year-olds and adults). The scores of the 13-year-olds are consistently above the scores of any other age level. Since only the 9-year-olds shared most of the same tasks,

TABLE 14. Job Selection by 17-Year-Olds

	Office Helper	Salesperson	Apprentice Mechanic
National	44%	25%	30%
Region			
Southeast	43	23	33
West	47	18	34
Central	45	26	29
Northeast	42	31	26
Sex			
Male	16	24	59
Female	70	26	4
Race			
Black	49	25	25
White	44	25	31
Parental education			
No high school	47	23	30
Some high school	45	24	31
Graduated high school	45	22	32
Post-high school	44	28	28
Size and type of community			
Low metro	48	21	30
Extreme rural	43	19	38
Small places	43	23	33
Medium city	41	32	27
Main big city	50	21	28
Urban fringe	42	27	31
High metro	50	27	23

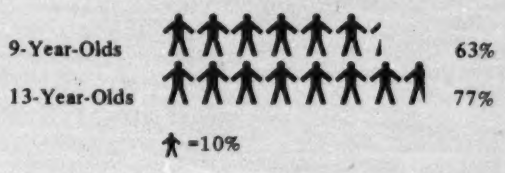
nothing should be made of the 13-year-olds' apparent eminence over all groups.

National Percentages of Success

In written communication skills, national percentages of success according to age level reflected the same basic trends as were seen in the other learning areas. Thirteen-year-olds had a higher average than 9-year-olds, although they did not take exactly the same set of exercises (Figure 8).

Of the older age levels, the adult group did best (Figure 9).

FIGURE 8. National Results for Written Communication Skills, Ages 9 and 13

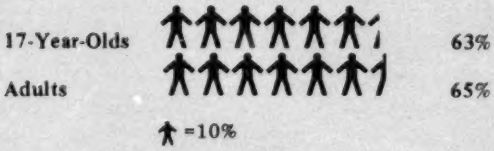


It is not clear why adults should do better on the exercises than the 17-year-olds. One would presume that students have more daily practice in written communication than a cross-section of adults. It may be that the job-related nature of the exercise gave the

TABLE 15. Job Selection by Adults

	Office Helper	Salesperson	Apprentice Mechanic
National	40%	31%	29%
Region			
Southeast	39	32	28
West	39	28	32
Central	44	30	26
Northeast	35	36	28
Sex			
Male	14	31	54
Female	64	31	5
Race			
Black	31	45	24
White	41	30	29
Parental education			
No high school	34	34	32
Some high school	43	33	24
Graduated high school	43	27	29
Post-high school	40	32	27
Size and type of community			
Low metro	31	35	33
Extreme rural	40	27	33
Small places	40	31	28
Medium city	42	32	26
Main big city	39	30	30
Urban fringe	40	32	27
High metro	40	33	26

FIGURE 9. National Results for Written Communication Skills, Ages 17 and Adult



more experienced adults an edge that could not be overcome.

Percentages of Success According to Region

Table 16 shows the relative success of each age level by region of the country compared to the national average for that age level.

Percentages of Success According to Sex

Table 17 shows the relative success of each age level by sex compared to the national average for that age level.

In the area of written communications, the female percentage of success was significantly above the national average in every age level. Males in all age levels scored significantly lower than the national average.

Percentages of Success According to Race

Table 18 shows the relative success of each age level by race compared to the national average for that age.

TABLE 16. Regional Results for Written Communication Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	63%	77%	63%	65%
Southeast	*53	*73	*62	*62
West	64	77	*61	67
Central	66	79	*65	*68
Northeast	67	*79	64	64

**Denotes a significant difference from the national average.*

TABLE 17. Male-Female Results for Written Communication Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	63%	77%	63%	65%
Male	*52	*75	*60	*62
Female	*73	*80	*66	*68

**Denotes a significant difference from the national average.*

TABLE 18. Racial Results for Written Communication Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	63%	77%	63%	65%
Black	*45	*64	*53	*53
White	*67	*80	*65	*68

**Denotes a significant difference from the national average.*

Percentages of Success According to Level of Parental Education

Table 19 shows the relative success of each age level by level of parental education.

Percentages of Success According to Size and Type of Community

Table 20 shows the relative success of each age level by size and type of community compared to the national average for that age level.

Again the economic factor must be considered. Low-metro areas are at a disadvantage in providing the environment that is conducive to successful performance of the skills assessed by National Assessment. High-metro areas, on the other hand, seem particularly conducive to such development.

Manual and Perceptual Skills

The fourth and final basic skill area assessed by the National Assessment career and occupational development survey is the

TABLE 19. Parental-Education Results for Written Communication Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	63%	77%	63%	65%
No high school	*49	*65	*58	*59
Some high school	*53	*73	*58	*62
Graduated high school	65	78	63	*68
Post-high school	*72	*82	*67	*74

**Denotes a significant difference from the national average.*

TABLE 20. Size-and-Type-of-Community Results for Written Communication Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	63%	77%	63%	65%
Low metro	*37	*67	*56	*54
Extreme rural	59	74	65	65
Small places	64	78	64	67
Medium city	67	75	63	62
Main big city	64	80	62	65
Urban fringe	64	79	65	67
High metro	*73	*82	66	*71

**Denotes a significant difference from the national average.*

learning area of manual and perceptual skills. Such skills usually involve the combination of several actions in a coordinated effort to accomplish a task. Perceptions are made (e.g., sight, hearing, etc.) and coordinated with some physical action. A good example of a manual and perceptual skill would be the action of striking a baseball with a bat. The ball is perceived visually, its speed and trajectory are calculated and the physical action of swinging the bat is coordinated with these perceptions to accomplish a solid hit.

Included in the manual and perceptual skills section were such operations as: manipulating small objects according to directions (e.g., folding a piece of paper as directed), using measurement instruments (these exercises were also part of the computation and measurement section) and drawing three-dimensional objects (e.g., picturing a flattened out cube in one's mind and transferring this picture to paper).

The following is an example of an exercise given to 9- and 13-year-olds to test their manual and perceptual skills.

(Hold up Handout: 2 sheets of paper folded together and stapled. Say:)

"Here are two pieces of paper that have been folded together and stapled.

"Show me the fastest way to fold and staple two pieces of paper together so that they look like this."

(Hold up sample.)

(Place 2 sheets of paper and stapler in front of respondent. The 2 pieces of paper must be separate, not on top of each other.)

In order to complete the task correctly, the respondent must take the two pieces of paper,

put them together, fold them and staple them. The neatness of the folding does not count, so long as the papers are folded together the short way rather than lengthwise. The staple must also be somewhere along the longest open edge, although not necessarily dead center.

Respondents were scored separately on three operations: (1) folding both papers together, (2) folding the papers in the correct place and (3) stapling the correct place.

Table 21 shows the national percentages of success for 9- and 13-year-olds on all three parts of the exercise.

TABLE 21. National Results, Folding Exercise, Ages 9 and 13

	9-Year-Olds	13-Year-Olds
Papers folded	83%	92%
Fold in correct place	95	98
Stapled in correct place	87	95

Respondents at the three upper age levels — 13, 17 and adult — were asked to draw several three-dimensional geometric figures. Four figures — a pyramid, a cylinder, a cube and a sphere — were attached to a base. The pyramid, cylinder and cube were in a line with the sphere placed directly in front of the cylinder.

The exercise administrator placed the base with the geometric figures directly in front of the respondent and provided sketching paper. The administrator then gave the following directions:

> *"Here are four objects mounted on a base. I want you to sketch a picture of the objects as they appear to you from where you are sitting."*

Participants were scored on three operations: (1) the positions of the four objects, (2) their three-dimensionality and (3) their relative size.

Table 22 indicates the national percentages for the three age levels on each of the three operations.

TABLE 22. National Results, Sketching Exercise, Ages 13, 17 and Adult

	13-Year-Olds	17-Year-Olds	Adults
Position of four objects	73%	77%	69%
Three-dimensionality	69	79	72
Relative size	18	21	20

All respondents had the most difficulty with allowing for the relative size of each object to be sketched. They fared considerably better with rendering the objects in three dimensions. The first operation, that of positioning the four objects, was probably the most indicative of the three tasks, for it determined whether the respondents could follow some basic directions and it required the rudiments of manual and perceptual proficiency for successful completion.

Although this exercise did not seem particularly difficult, the percentages of success show that it was more complex than it appeared. It did demonstrate the use of some basic skills that are invaluable in the world of work (e.g., following directions, giving attention to detail, using coordinated faculties).

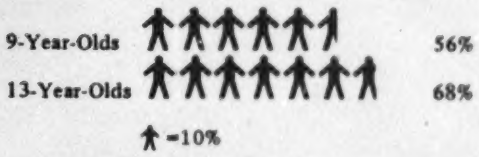
Summary: Manual and Perceptual Skills

Following is a summary of results for all exercises in the area of manual and perceptual skills.

National Percentages of Success

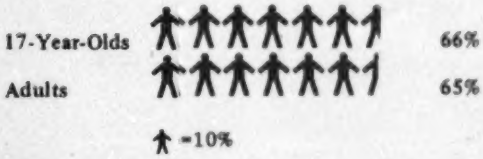
The 13-year-olds continue to score relatively higher than the 9-year-olds (Figure 10).

FIGURE 10. National Results for Manual and Perceptual Skills, Ages 9 and 13



In the older levels we see a change in the usual trend: adults had slightly less success with the exercises than did the teenage group (Figure 11).

FIGURE 11. National Results for Manual and Perceptual Skills, Ages 17 and Adult



It may be somewhat alarming that so many people in the older age levels seem to lack skills that are common to so many different occupations. Proficiency in following directions, coordinating physical and mental actions and taking some care with detail is not a particularly unusual job demand.

Percentages of Success According to Region

Table 23 shows the relative success of each age level by region of the country compared to the national average for that age level. There are no dramatic differences from average regional scores shown previously for the other skill areas.

Percentages of Success According to Sex

Table 24 shows the relative success of each age level by sex compared to the national average for that age level. The sexes still seem to maintain their traditional roles; in this spatial relations exercise, the male percentages were significantly better than the national average and female percentages were significantly worse.

Percentages of Success According to Race

Table 25 shows the relative success of each age level by race compared to the national average of that level.

TABLE 23. Regional Results for Manual and Perceptual Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	56%	68%	66%	65%
Southeast	*50	*63	*59	*62
West	56	69	67	66
Central	*59	*70	*69	67
Northeast	58	*70	66	66

**Denotes a significant difference from the national average.*

TABLE 24. Male-Female Results for Manual and Perceptual Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	56%	68%	66%	65%
Male	*57	*70	*68	*68
Female	*55	*67	*64	*63

*Denotes a significant difference from the national average.

TABLE 25. Racial Results for Manual and Perceptual Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	56%	68%	66%	65%
Black	*41	*53	*50	*53
White	*59	*71	*68	*67

*Denotes a significant difference from the national average.

Percentages of Success According to Level of Parental Education

Table 26 shows the relative success of four parental-education groups at four ages. Trends and significant variances do not differ radically from previous tables discussing this same variable.

Percentages of Success According to Size and Type of Community

Table 27 shows the relative success at each age level for each size-and-type-of-community group. The low-metro and high-metro categories continue to demonstrate the same significant extremes shown in other tables.

TABLE 26. Parental-Education Results for Manual and Perceptual Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	56%	68%	66%	65%
No high school	*46	*61	*57	*61
Some high school	*50	*63	*59	*62
Graduated high school	55	68	66	*67
Post-high school	*61	*73	*70	*71

*Denotes a significant difference from the national average.

TABLE 27. Size-and-Type-of-Community Results for Manual and Perceptual Skills, All Ages

	9-Year-Olds	13-Year-Olds	17-Year-Olds	Adults
National average	56%	68%	66%	65%
Low metro	*42	*60	*59	*57
Extreme rural	51	66	65	65
Small places	57	68	66	66
Medium city	57	68	67	62
Main big city	55	68	66	63
Urban fringe	58	70	68	67
High metro	*64	*74	*69	*71

**Denotes a significant difference from the national average.*

CHAPTER 4

IMPLICATIONS

In developing the items for its assessment of career and occupational development (COD), the National Assessment of Educational Progress (NAEP) incorporated exercises that measured knowledge and skills related to the world of work. The overall intent of these items was to garner data on the skills and knowledge that are regarded as *generally useful* in the working world. Ability levels of basic skills in computation and measurement, use of graphic and reference materials, written communication, and manual and perceptual skills can serve as double-duty barometers: they can be used to evaluate the proficiency of the population in handling basic academic tasks, tasks that have traditionally set the standards for academic success; and they offer a point of view for speculating about the population's probable success in varied career endeavors (on the job, as consumers, as citizens).

Such speculation over the future of the school-age population might outstrip the original intent of the assessment results, but it is nothing more than any thoughtful reader would do when presented with the "facts in the case." When, for instance, one is presented with the fact that 17-year-olds demonstrate an average proficiency of 63% in the area of written communication, it is difficult not to wonder how the other 37% of these young people will fare when faced with the communications demands of the world beyond the classroom.

A defensible premise can be made for this kind of speculation. Among young adults there is a relationship between basic skills proficiency and certain variables that define "success" according to convention. Level of education achieved and family income, for instance, are proportionately higher for those within the adult population who show more proficiency in basic skills execution.[1] It is probable that basic skills proficiency as demonstrated in this survey has some bearing on future career success. As with their adult counterparts, 17-year-olds who perform below average in basic skills exercises are more apt to be included in the future list of those who live in the low-metro areas (with high unemployment and large welfare rolls), who have a family income under $5,000 and who have not completed any course of education and/or training.

The following table (Table 28) compares 17-year-olds and adults in their basic skills proficiency on some variables related to conventional success.

Another variable, that of family income, was recorded for the adult population. According to this variable, the group with family income under $5,000 averaged 57% correct on the basic skills items while the group with family income over $15,000 averaged 78% correct on these items.

Whether, in fact, the 17-year-old population that showed less than average proficiency in the National Assessment survey will find difficulties in attaining success in such career areas as the military, apprenticeship programs, college or university, consumerism and

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[1] *Adult Work Skills and Knowledge: Selected Results From the First National Assessment of Career and Occupational Development, Report 05-COD-01* 1973-74 Assessment (Washington, D.C.: Government Printing Office, 1976).

TABLE 28. General Averages of Basic Skills Proficiency, Ages 17 and Adult

	National Average	Size and Type of Community		Level of Parental Education	
		Low Metro	High Metro	No High School	Post-High School
Adults	72%	59%	80%	65%	80%
17-year-olds	70	61	75	62	74

citizenship remains to be seen. However, if the young adult population is any barometer for future trends, it can be stated with some probability that a significant number of young people will be held back from the opportunities for conventional success. Seen in this light, the NAEP assessment of career and occupational development can go beyond the presentation of summary results and serve as a basis for creative and productive analysis of the problems facing young people as they enter the world of work. Future National Assessment reports will present information about the work knowledge, career-choosing skills and self-evaluation capacities of school-aged Americans.

★U.S. Government Printing Office: 1976-777-857/74 Region 8

ME 805 S070